

## IN THE UNITED STATES PATENT AND TRADE MARK OFFICE

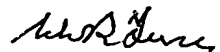
VERIFICATION OF TRANSLATION

I, Michael Wallace Richard Turner, Bachelor of Arts, Chartered Patent Attorney, European Patent Attorney, of 1 Horsefair Mews, Romsey, Hampshire SO51 8JG, England, do hereby declare that I am conversant with the English and German languages and that I am a competent translator thereof;

I verify that the attached English translation is a true and correct translation made by me of the attached specification in the German language of International Application PCT/EP03/07984;

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: October 15, 2004



M W R Turner

Individualized security document

The invention concerns an individualized security document such as a passport, a driver's license, a notarial certificate, an authenticity, license guarantee certificate, a savings book or bankbook or the like which has a  
5 number of pages which are joined together by means of stitching, folding or adhesive.

Such security documents involve use of transfer films as are described in DE 199 40 790 A1. That known transfer film does not require a relatively high level of machine complication and expenditure for  
10 processing thereof but can be reliably and properly processed using relatively simple apparatuses because the transfer film, by virtue of its base film which is stable in respect of shape, enjoys the stability required for simple processing. In that known transfer film, the base film with a carrier film and with a decorative layer arrangement can be subdivided  
15 into a plurality of label-like individual elements, in which case the individual elements can be arranged on a carrier film web in such a way that they can be pulled off the web.

The management and handling of such individual elements or transfer films provided with security elements, and the associated  
20 individualized security documents such as passports, savings books or bankbooks or the like involves a degree of complication and expenditure which cannot be disregarded. The above-mentioned handling operation and the management procedure also involve possible sources of error.

Therefore the object of the present invention is to provide an  
25 individualized security document of the kind set forth in the opening part of this specification, wherein handling and management of the security documents and the transfer film which is provided with security elements is substantially simplified.

According to the invention that object is attained by the features of  
30 claim 1. Preferred developments and embodiments of the security

document according to the invention are characterized in the appendant claims.

5 In accordance with the invention incorporated into the individualized security document is a transfer film which is provided with at least one security element and which has a base film and a decorative layer arrangement having the security elements. The transfer film provided with security elements is incorporated into the security document by adhesive or stitching or tacking of the security document. That advantageously provides for accurate positioning of the transfer film or the security elements of the transfer film in relation to the respective security document. It would also be possible for the security element to be glued into the security document by means of an adhesive or an adhesive strip. That can involve a temporary adhesive or a permanent adhesive. It is particularly advantageous that handling of the security documents and the transfer films provided with the security elements is substantially simplified and special management thereof is virtually eliminated. In a further advantageous manner that provides that possible sources of error in regard to associating security documents and associated transfer films provided with security elements are substantially reduced.

20 In accordance with the invention the base film of the transfer film which is provided with security elements can comprise a plastic material. The plastic material may be a non-transparent or a transparent plastic material. Such a configuration of the last-mentioned kind, with a base film comprising a transparent plastic material, has the advantage that positioning of the transfer film is easily possible and that checking and comparison for example of data and pass numbers and so forth are easily possible.

25 In accordance with the invention it is also possible for the base film of the transfer film which is provided with security elements to comprise paper or a paper-like substrate. In such an embodiment the base film can have at least one window opening. It is for example possible for the pass

number for example of the security document to be made visible during the personalization procedure through the window opening.

Irrespective of whether the base film comprises paper or transparent plastic material, the decorative layer arrangement having security elements can be temporarily connected by means of a release layer to a carrier film which is permanently joined to the base film by means of a permanent adhesive. If the base film comprises a transparent plastic material, it is optionally also possible to forego the carrier film.

In accordance with the invention the decorative layer arrangement having security elements can be dispensed as a label onto the base film or to the carrier film permanently connected to the base film. Another possible option provides that the decorative layer arrangement is laminated onto the base film or onto the carrier film permanently connected to the base film.

The security element can completely or only partially cover one page of the security document. It is possible to provide holes or openings in order for example to leave free a signature area or space for an integrated chip.

The security elements of the decorative layer arrangement may involve structures which have a holographic action or which have an optical-diffraction effect.

In the individualized security document of the invention the base film and/or the carrier film can be provided with position markings for accurate positioning of the decorative layer arrangement. It is likewise possible for the base film and/or the carrier film to be provided with numberings, barcodes or universal product codes or the like.

For easily performing the operation, in a labor-saving and time-saving manner, of cutting out the base film or the base film with the carrier film permanently connected thereto, after transfer of the decorative layer arrangement onto the associated page of the security document, it has proven to be advantageous if the base film is provided with a perforation. Independent patent protection is requested in this

respect. In this connection, it is possible that the perforation is provided only in the base film and the decorative layer arrangement is laterally spaced from the perforation, or that the perforation extends through the base film and through the decorative layer arrangement.

5 By folding configurations, stampings, projecting "corners" and the like, the composite structure consisting of the decorative layer and the transfer film can be modified in such a way that a cutting-out operation can be effected more easily, after the lamination step.

10 In accordance with the invention the perforation of the transfer film having security elements can be provided in alignment with the tacking or stitching fixing or adhesive of the security document and the transfer film provided with the security elements can be fixed by means of the tacking or stitching or adhesive in the security document. Another possibility provides that the perforation of the transfer film having security elements  
15 is disposed laterally displaced with respect to the tacking or stitching or adhesive of the security document and the edge region of the transfer film, which is defined by the perforation, is fixed by means of the tacking or stitching or adhesive in the security document, in such a way that a base film strip remains on both sides of the tacking or stitching or  
20 adhesive when the base film, after transfer of the transfer film onto the corresponding page of the security document, is separated out of the security document along the perforation.

In such a configuration of the last-mentioned kind, the base film can comprise a security paper having security features, optionally with  
25 printing thereon, so that this provides a base film strip with corresponding security features, the base film strip remaining in the security document.

Optionally it is also possible for the transfer film to be printed upon in the individualization or personalization procedure.

30 In accordance with the invention the transfer film provided with security elements can involve surface dimensions adapted to a page of the security document. It is however also possible for the transfer film

provided with security elements to be of surface dimensions adapted to a double page of the security document.

Further details, features and advantages will be apparent from the description hereinafter of the embodiment, diagrammatically illustrated in the drawing, of the individualized security document according to the invention such as a passport, a savings book or bankbook or the like. In the drawing:

Figure 1 diagrammatically shows a front view of a first embodiment of the security document,

10        Figure 2 shows a front view similar to Figure 1 of a second embodiment of the security document,

Figure 3 shows a front view similar to Figures 1 and 2 of a third embodiment of the security document,

15        Figure 4 shows a front view similar to Figures 1 through 3 of a fourth embodiment of the security document,

Figure 5 is a diagrammatic view, which is not true to scale, of an embodiment of the transfer film of the security document shown in Figure 2,

20        Figure 6 is a diagrammatic view similar to Figure 5 of another embodiment of the transfer film for the security document as shown in Figures 1, 2 or 3, and

Figure 7 is a greatly enlarged sectional view, which is not true to scale of the transfer film as indicated at the detail VII in Figure 5.

25        Figure 1 diagrammatically shows an opened individualized security document 10 which for example is a passport. The security document 10 has a cover 12 and a number of pages 14 which are joined together and to the cover 12 by means of a fixing or tacking 16. The tacking 16 can be a stitched seam or a staple arrangement. The pages 14 and the cover 12 can also be joined together in per se known manner by means of  
30        adhesive.

A transfer film 18 provided with security elements is incorporated into the security document 10 by means of the tacking or stitching 16.

The transfer film 18 has a base film 20 and a decorative layer arrangement 22 having the security elements, as will be described in detail hereinafter with reference to Figure 7. Such a transfer film is also disclosed in above-mentioned DE 199 40 790 A1.

5       After the transfer of the decorative layer 22 indicated in Figure 1 by a broken line, this operation being effected by the suitable action of heat, in which case the base film 20 is detached from the decorative layer arrangement 22, the base film 20 is cut out of the security document 10. The decorative layer arrangement 22 remains adhering firmly over a large  
10       area to the corresponding page 14 of the security document 10. The decorative layer arrangement 22 can also be provided on the cover 12 and can cover it extensively or partially.

      Figure 2 is a diagrammatic view similar to Figure 1 showing a security document 10 with a cover 12 and pages 14 which are joined  
15       together and to the cover 12 by means of a fixing 16 to form the security document 10. Incorporated into the security document 10 is a transfer film 18 having a base film 20 and a decorative layer arrangement 22.

      The transfer film 18 is provided with a perforation 24. As Figure 5 also clearly shows, the perforation 24 is provided in the base film 20 and  
20       is laterally spaced from the decorative layer arrangement 22. That lateral spacing is identified by reference 26 in Figure 5. The perforation 24 is definedly spaced from the one edge 28 of the base film 20 and extends parallel to the edge 28. That spacing is identified by reference 30 in Figure 5. The transfer film 18 is incorporated into the security document  
25       10 in such a way that the stitching or fixing 16 extends in a central region of the edge portion 32 of the base film 20, which is delimited by the side edge 28 of the base film 20 and the perforation 24 in the base film 20 (see Figure 5).

      After transfer of the decorative layer arrangement 22 onto the  
30       associated page 14 of the security document 10, the base film 20 which is released from the decorative layer arrangement 22 during the transfer operation is cut out of the security document 10 along the perforation 24

so that a respective base film strip 34 remains on each of the two sides of the fixing 16 (see Figure 2). That base film strip 34 can have security features. In such a design configuration, the base film 20 of the transfer film 18 which is incorporated into the security document 10 desirably comprises a security paper.

Figure 2 diagrammatically illustrates a design configuration in which the perforation 24 of the transfer film 18 and the stitching fixing 16 of the security document 10 are laterally spaced from each other. In comparison Figure 3 diagrammatically shows an embodiment in which the stitching 16 of the security document 10 and the perforation 24 of the transfer film 18 which is bound into the security document 10 are provided in coincident relationship. After transfer of the decorative layer arrangement 22 onto the associated page 14 of the security document 10 the base film 20 is cut out of the security document 10 along the perforation 24 entirely, that is to say without any residue, on both sides of the fixing 16.

Figures 1 through 3 show embodiments of the individualized security document 10 in which the transfer film 18 provided with security elements is of surface dimensions adapted to one page of the security document 10. In comparison Figure 4 diagrammatically shows an embodiment in which the transfer film 18 provided with security elements is of surface dimensions which are adapted to a double page of the individualized security document 10.

The same features are each identified in Figures 1 through 4 by the same references so that there is no need all features to be respectively described in detail again in relation to all those Figures.

Figure 6 diagrammatically shows an end view similar to Figure 5 of an embodiment of the transfer film 18 with a perforation 24 which extends through the base film 20 and through the decorative layer arrangement 22 of the transfer film 18.

Figure 7 is a greatly enlarged sectional view which is not true to scale of an embodiment of the transfer film 18 with the base film 20 of



paper or transparent plastic material and with the decorative layer arrangement 22 which is detachably connected to a carrier film 38 by means of a release layer 36. The carrier film 38 is permanently connected to the base film 20 by means of a permanent adhesive 40. The carrier film 38 and the decorative layer arrangement 22, with the release layer 36 provided between them, form a per se known hot stamping film 42.

If the base film 20 comprises a transparent plastic material, it is optionally also possible to eliminate the carrier film 38.

The decorative layer arrangement 22 has a protective lacquer layer 44 and a replication lacquer layer 46. That replication lacquer layer 46 has a structure 48 which has a holographic action or which has an optical-diffraction effect. The structure 48 is provided with a highly reflective layer 50, thereby providing a security element. The decorative layer arrangement 22 also has a bonding agent or first adhesive layer 52. The bonding agent or first adhesive layer 52 is provided with markings 54. The bonding agent or first adhesive layer 52 with the markings 54 is covered by a second adhesive layer 56. The second adhesive layer 56 is partially provided with printing 58 thereon.

In regard to further details such as the composition, the layer thicknesses and so forth of the individual layers of the transfer film 18, reference is directed to above-mentioned DE 199 40 790 A1 which in that respect constitutes part of the disclosure of the present invention.

Thus for example the transfer film 18 is of the following detailed composition:

#### Base film 20

The base film 20 is a reinforcing layer which is known per se from labels. It is possible to use for example a plastic film. Preferably however a silicone paper is used as the base film.

#### Permanent adhesive 40

The permanent adhesive 40 has to reliably perform the function of ensuring that the base film 20 and the carrier film 38 remain firmly joined together even when heat is used for transferring the transfer film onto the

substrate. That condition is met by generally familiar, permanently adhering acrylate dispersion adhesives.

#### Carrier film 38

Here the carrier films which are usual in relation to hot stamping films are used, in which respect plastic films which have a very smooth surface in order not to adversely affect the transparency of the decorative layer arrangement due to surface irregularities are appropriately used. In a large number of cases the carrier film used is polyester films of a thickness of 20  $\mu\text{m}$ , in which respect, in the present case, it is also possible to use thinner carrier films as in fact the carrier film is reinforced by the base film during the handling procedure.

The release layer is generally applied over the full surface area involved, in a layer thickness of between about 0.01 and 0.2  $\mu\text{m}$ .

#### Protective lacquer layer 44

The protective lacquer layer 44 is also generally applied over the full surface area, more specifically in a layer thickness of between 0.5 and 5.0  $\mu\text{m}$ , preferably between 1 and 2  $\mu\text{m}$ .

#### Replication lacquer layer 46

The replication lacquer layer 46 can be applied over the full surface area involved, but also only in a region-wise manner, more specifically when for example the aim is to provide that the structure 48 which has a holographic action or which has an optical-diffraction effect is provided only in a region-wise manner. The layer thickness of the replication lacquer layer is between 0.05 and 1.5  $\mu\text{m}$ .

#### Structure 48

The structure 48 can be a generally known structure which is conventional for so-called OVDs and which has an optical-diffraction effect or a holographic action, for example a grating structure, the optical properties of the structure being determined by the corresponding structural parameters, for example grating frequency, grating depth, grating inclination and so forth. The structure is generally introduced into

the replication lacquer layer 46 in a replication procedure during production of the hot stamping film 42.

#### Highly reflective layer 50

5 The function of the highly reflective layer 50 is to improve the visibility of the structure 48 which has a holographic action or an optical-diffraction effect, in which respect, as consideration of Figure 7 shows, it is at the same time necessary to ensure that the viewer can see through the layer 50 in order to recognize the markings 54 and the printing 58.

10 That function can be fulfilled for example by a vapor-deposited, highly refractive layer of a thickness of between 10 and 500 nm, in which respect for example metal oxides, metal sulfides, titanium dioxide and so forth can perform that function.

#### Adhesive layers 52 and 56

15 As already mentioned, it is possible for the two layers 52 and 56 to be produced from the same transparent material. It would however also be conceivable for the layer 52 to be provided only as a bonding agent layer between the adhesive layer 46 and the coating 50 of the structure 48.

20 In the illustrated embodiment it is assumed that two identical adhesive layers are used, which are provided over the full surface area and which involve a layer thickness of between 2 and 10  $\mu\text{m}$ , preferably between 3 and 6  $\mu\text{m}$ .

#### Markings 54

25 The markings preferably involve elements which are applied in a printing operation after application of the first adhesive layer, for example special graphic elements, a text - visible only under given viewing conditions - , and so forth. In the illustrated embodiment it is assumed that the markings are formed by a decorative lacquer which is responsive to UV light.

#### 30 Printing 58

As already mentioned, the printing 58 applied to the free surface of the adhesive layer 46 is produced by means of familiar printing processes,

for example by means of laser printing, thermotransfer printing, and so forth. It would theoretically even be possible to apply further markings by hand, instead of a printing 58. Laser printing or thermotransfer printing however are to be preferred because in that case, by virtue of the transfer film being fixed on the substrate and the effect of heat, it is to be assumed that the particles producing the printing at least partially also directly adhere to the substrate. If then in such a situation an attempt is made to detach the decorative layer arrangement from the substrate, it must be reckoned that at least residues of the printing serving for identification purposes adhere directly to the substrate, so that it is not possible to detach the decorative layer arrangement without leaving traces.

A particularly advantageous embodiment of the transfer film is such that the decorative layer arrangement is transparent and the adhesive layer serving for fixing the decorative layer arrangement to the substrate is printed by means of a printer, for example a laser printer or a thermotransfer printer. When using a transfer film of that kind for example suitable individualization can be effected by printing on the adhesive layer. It is for example conceivable for the page of a passport, which contains the personal data, to be safeguarded using the transfer film, in which case the basic information can be applied in production in the factory of the transfer film using a suitable printing process, for example between individual layers of the decorative layer arrangement, which are provided over the entire surface area, while the person-related data, for example name, forename, address, date of birth and picture of the passport holder, are then applied by printing by means of a suitable printer prior to use of the transfer film, on the adhesive layer thereof. After the individualizing printing operation the transfer film is then laid with the printed adhesive layer onto the adjacent page of the security document and then fixed to that page by heat or possibly the effect of pressure. This embodiment has the advantage that the items of individualizing information are covered over by the decorative layer

arrangement of the transfer film, in other words, it is not possible to make a change without at the same time damaging the decorative layer arrangement. If an attempt is made to pull the decorative layer arrangement off the page in order to alter the individualizing data, it is  
5 necessary to reckon on the decorative layer arrangement being destroyed. In addition, in the normal situation, it is to be assumed that the individualizing data are also to be found on the page again, because, with the usual process conditions, on the transfer film, at least a certain proportion of the printing ink present on the adhesive layer is also  
10 connected directly to the substrate.

The decorative layer arrangement can be colored or printed upon.